

Confirmed records of the endangered Trout Cod *Maccullochella macquariensis* from the Murray River at Gunbower Island, Victoria

Introduction

The historical range of Trout Cod *Maccullochella macquariensis* (Cuvier, 1829) is thought to have included much of the southern Murray–Darling Basin (Lintermans 2007; Trueman 2007). Severe reductions in both abundance and distribution have led to the conservation status of the species being listed as ‘Endangered’ (*Environment Protection and Biodiversity Conservation Act* 1999; *Flora and Fauna Guarantee Act* 1988). By the 1980s Trout Cod was restricted to only one, viable, naturally occurring population, located in the Murray River between Yarrawonga and Toomumwal (Berra 1974; Cadwallader *et al.* 1984; Ingram *et al.* 1990). The present distribution of this Trout Cod population is now reported to have increased and includes the Murray River (and anabranches) from Yarrawonga to around Barmah (TCRT 2008; Lintermans 2007) (Fig. 1).

This note presents information indicating the contemporary distribution of the Murray River Trout Cod now extends in the Murray River at least to Cohuna. This extension may raise implications for future Trout Cod management.

Chronology of Trout Cod range extension in the Murray River

In April 2009, the authors angled four juvenile Trout Cod (180–200 mm total length) from the Murray River near Whistler Track on Gunbower Island near Cohuna, Victoria. More Trout Cod were angled by the authors from the same area in April 2010. These confirmed captures indicate Trout Cod are now present in the Murray River in the Gunbower Island area.

Recreational anglers have also reported Trout Cod from the area and these unconfirmed reports appear to be increasing. Anglers have reported captures at Gunbower Island to the local Cohuna tackle store and on angler internet

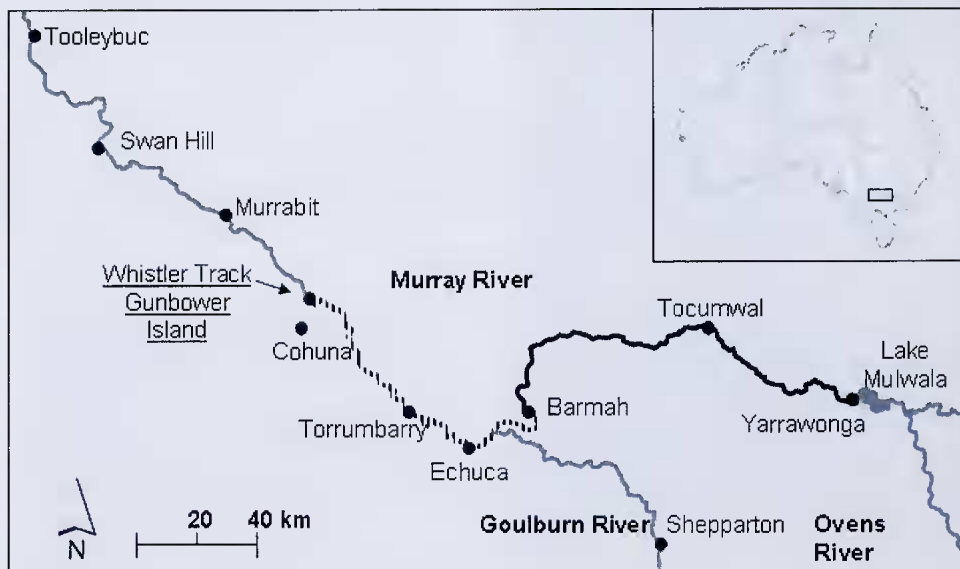


Fig. 1. Distribution of the Trout Cod population in the Murray River, south-east Australia. Bold line indicates published Trout Cod distribution in the Murray River as reported in Lintermans (2007); hashed line indicates the contemporary range extension presented in this study.

forums (Fishnet and Fishvictoria). Additional anecdotal reports from anglers familiar with the species have also been received concerning one fish near Murrabit in 2007, two fish from Swan Hill in 2007 and one fish near Tooleybuc in 2008.

Indication of an extension in the contemporary distribution of the Murray River Trout Cod population has been building for some time. Prior to 2007, isolated reports from downstream of the Tocumwal area were occasionally received. For example, an unconfirmed Trout Cod was taken by a commercial fisherman near Barmah in 1983. But the initial extension in the contemporary distribution of the Murray River population was published only in 1993, when a single fish was collected from an anabranch of the Murray River in Barmah Forest (McKinnon 1993). This was followed shortly afterwards by anecdotal angler reports of juveniles being taken in the area. By about 2005, confirmed adult and juvenile Trout Cod were regularly sampled in the Murray River near Barmah (Victorian Department of Primary Industries unpubl. data) and the collection of Trout Cod larvae by King *et al.* (2009) indicates that Trout Cod breeding was occurring in the Barmah–Millewa area. Unconfirmed reports of Trout Cod captures between Barmah and Echuca were received from recreational angler creel surveys conducted by the Victorian Department of Primary Industries in late 2008 (Brown 2009). Fish movement through the Torrumbarry Weir fishway is monitored by Goulburn Murray staff and the weir keepers recall seeing at least one Trout Cod in the fishway (Terrence W Holt, Senior Reservoir Controller, Torrumbarry Weir, pers. comm., 3 October 2009).

Discussion

The captures of confirmed Trout Cod from the Murray River near Cohuna confirm an extension in the contemporary distribution of the Trout Cod in the Murray River population. This extension is a positive development in Trout Cod conservation and should encourage conservation efforts as applied to the Murray River population.

A key question regarding the presence of Trout Cod in the Murray River at Gunbower Island is

the source of the fish and whether the fish are wild or derived from hatchery stockings. We argue that the Trout Cod in the Murray River near Gunbower Island are most likely to be the result of range extension in the wild population rather than migration from hatchery produced stocked fish.

Fish production techniques for a range of native freshwater species—including Trout Cod—have been developed and refined by both NSW and Victorian fisheries agencies to the stage where they are now routine (Ingram *et al.* 1999a; Ingram *et al.* 1999b; Ingram *et al.* 1992). This has allowed restocking programs to be undertaken in an attempt to re-establish viable Trout Cod populations in the Murray–Darling Basin (Ingram *et al.* 2008). Stocking activities have reintroduced nearly one million Trout Cod into eight river catchments across the Murray–Darling Basin (Ingram *et al.* 2008). Evidence of natural recruitment from the stocked fish has been confirmed in four rivers and is suspected in another three rivers (Ingram *et al.* 2008). Despite the limited success of the Trout Cod breeding and stocking programs, the stocking sites are all a considerable distance from Gunbower Island, and such activities are therefore not considered to be implicated in the extension of the contemporary distribution of the Murray River Trout Cod population presented in this report.

There is evidence that some stocked Trout Cod do move from their original stocking site, but as adult Trout Cod have small home ranges—a few hundred metres (Lintermans 2007)—and the closest Trout Cod stocking locations are hundreds of kilometres away in the Murrumbidgee, Ovens and Goulburn Rivers, migration from these areas is not considered as a likely explanation of Trout Cod at Cohuna.

The Murrumbidgee River is stocked with Trout Cod around Narrandera and NSW Fisheries report the current downstream extent of Trout Cod as Leeton Ski Club (Dean Gilligan, pers. comm.). Leeton Ski Club is estimated to be over 400 km upstream of the Murray River junction near Tooleybuc; therefore, Murrumbidgee River Trout Cod stockings are unlikely to explain the captures at Gunbower Island.

The Ovens River has been stocked with Trout Cod and was formerly considered the upstream limit of the contemporary range in the Murray River (Lintermans 2007). Given that the Ovens River enters Lake Mulwala upstream of Yarrawonga Weir, it is highly unlikely that stocked fish have travelled downstream from their stocking site, through Lake Mulwala, the Yarrawonga and Torrumbarry weirs, to the existing Trout Cod population below Yarrawonga at Gunbower Island.

Trout Cod have been stocked into the Goulburn River upstream of Shepparton and there is evidence of continued occupation and breeding of stocked fish in the river (Koster *et al.* 2004). This is the closest stocked population to Gunbower Island. It is feasible that some of these fish may have travelled downstream to the Murray River and then through Torrumbarry Weir to Gunbower Island. It is possible that some of the Goulburn River fish could have moved downstream into the Murray River and be responsible for some of the Trout Cod captures reported by anglers from the river in the Echuca area.

Given the chronology of reports of Trout Cod numbers increasing downstream in the Murray River from Tocumwal, we consider that it is more likely that the Trout Cod in the Gunbower area represent an extension of the contemporary distribution of the Murray River Trout Cod population—through recruitment and expansion in the natural population—rather than immigration of stocked Trout Cod. However, the fish stocked in the Goulburn River cannot be discounted as the source. Regardless of the source, Trout Cod are now present in the Murray River at Gunbower Island.

We conclude that the Trout Cod distribution in the Murray River has extended past the previously-published limits in Lintermans (2007) and currently extends downstream from Yarrawonga to at least the Murray River contiguous with Gunbower Island. An extension in Trout Cod population distribution in the Murray River has implications for the management of the species, both in terms of regulations and where people expect to find the species.

The current NSW Fisheries recreational angling regulations include a seasonal angling closure downstream from the Yarrawonga Weir

to the Newell Highway Bridge at Tocumwal. The regulations may require review as the distribution of Trout Cod along the Murray River extends well beyond this protected area.

A major problem with Trout Cod conservation is the difficulty of distinguishing the species from the closely related Murray Cod *Maccullochella peelii*. Anglers may easily misidentify Trout Cod as Murray Cod because they may not be aware of their presence in the mid-Murray River and therefore do not correctly identify the species. Educational programs may now be required to inform recreational fishers that Trout Cod distribution has extended in the Murray River. A publicity campaign highlighting the extended distribution and how to distinguish Trout Cod from Murray Cod may assist in fisheries compliance issues and in protecting the endangered Trout Cod in their expanding distribution.

A specific objective of the current national Trout Cod recovery plan is to facilitate continued sustainability of Trout Cod populations. A specific performance criterion for the objective is that the area of occupancy of the natural Murray River population is stable or increasing (TCRT 2008). Evidence of an extension in the distribution of the population would meet this performance criterion and indicate that conservation efforts for the recovery of Trout Cod are being effective.

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One hundred and ten years ago

NATURAL HISTORY NOTE

The hon. secretary read an extract from a letter from Mr. M'Bain, of Point Lonsdale, to Mr. S. A. Le Souef with reference to the spawning of the Murray Cod, *Oligorus macquariensis*, in which the writer gave it as his experience that the fish spawns about November, when the river, owing to the melting of the snow, is at its highest, and spreads over the flats along its banks, sometimes for miles. Though he had not seen the ova he believes the fish spawn in hollow burnt logs on the flats, where the water is warm, having frequently disturbed the fish in such places, and afterwards seen young fry not more than a quarter of an inch long swimming about in the holes. Directly the water commences to recede the young fry depart and are next found in the main streams in places where there are eddies, and the banks fringed with weeds and long, thin grass; here they are about an inch long, and if not disturbed will remain in the locality until the next season, when they will be about 4 inches in length.

From *The Victorian Naturalist* XIX, p. 83, October 9, 1902